

Abstract

A method of forming bumped substrates with protuberances for inverted or flip-connection bonding of electronic devices including semiconductor devices, integrated circuits, and/or application specific integrated circuits and electromechanical devices. The substrates are high temperature insulating materials provided with a conductive pattern. The conductive pattern has contact areas corresponding to the input/output (I/O) pads of the electronic device. A metal is applied over the contact areas, and the temperature is raised above the melting point of the metal causing the metal to melt and draw back into a convex protuberance over the contact areas. The convex protuberances are suitable for connecting to the electronic devices by conductive adhesive bonding or metallurgically bonding such as thermocompression, thermosonic or ultrasonic bonding.